

Incineration of Mass Quantities of Poultry Carcasses: Lessons Learned from the Virginia Avian Influenza Outbreak in 2002



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Why were other options used in 2002?



- ◆ Public opposition to the burial of the first two flocks because of alleged groundwater contamination from carcasses buried during the 1984 outbreak.

A 1984 on-farm
burial site at present



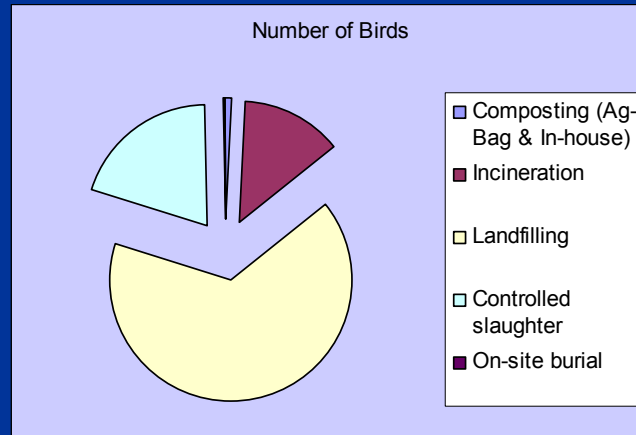
...and where intact
carcasses were
discovered during
excavation in 1998.

Methods of Disposal Used in 2002*

| Method of Disposal | Number of Birds | Percent of Total |
|-----------------------------------|------------------|------------------|
| On-site Burial | 15,000 | 0.3 |
| Controlled slaughter | 943,000 | 19.9 |
| Incineration | 641,000 | 13.4 |
| Landfilling | 3,103,000 | 65.5 |
| Composting (Ag-Bag & In-house) | 43,000 | 0.9 |
| Total | 4,732,000 | 100.0 |

* Rendering was not utilized in 2002 because of biosecurity concerns.

Methods of Disposal Used in 2002



Incineration (2002)



Incineration of Mass Quantities of Poultry Carcasses Prior to 2002 in the U.S.

- ◆ In 1996, birds drowned as a result of Hurricane Floyd were incinerated.
- ◆ Mobile air curtain destructors were utilized.
- ◆ According to the contractor, the poultry carcasses were difficult to burn.
- ◆ Incineration worked better with swine because the swine carcasses have more fat and do not have feathers that can retain water.

The Decision on Utilizing Incineration - 2002

- ◆ Prior to placing the units in service in Va., representatives from the poultry industry and DEQ met with the contractor in North Carolina
- ◆ The conclusions :
 - 1) Utilizing mobile air curtain destructors at a central site would be more efficient than using an air curtain unit on an excavated pit at each farm
 - 2) Regardless of which method, this was a complex option to manage.
 - 3) The cost would be prohibitive compared to landfilling (estimate of \$500/ton versus \$150)

Decision on Utilizing Incineration – 2002 (cont'd)

- ◆ Despite the previous issues related to incineration, USDA decided to give this option a try because:
 - The volume of carcasses to be disposed of exceeded the capacity of landfills that had committed to receive carcasses (cost is not the only factor to consider)
 - There was a need to obtain data on the true costs and effectiveness of utilizing incineration to dispose of mass quantities of euthanized carcasses (as opposed to the previous experience with birds that had drowned)

Lessons Learned during 2002

Why did costs escalate during the operation?

Costs during the first few days were only \$82/ton. However, costs escalated to over \$500/ton by the end of the operation.

- Effect of weather on carcasses and wood
- Importance of utilizing quality wood
- Management of loading air curtain destructors
- Equipment breakdowns
- Scheduling of carcass delivery

Quality of Wood



- ◆ Undesirable wood characteristics:
 - Rotted wood
 - Small diameter (brush)
 - Saturated wood
 - Too much metal (especially if the ash is to be recycled as a soil amendment)

Management of Loading Air Curtain Destructors



Factors:

- 1) Once the fire has reached operating temperatures, carcasses need to be loaded evenly across the length of the fire box to avoid cooling of the fire by “clumps” of cool carcasses
- 2) Have enough trained operators to load no more than 2 - 3 hours per shift

Equipment Breakdown

- ❑ 24 hour operations can lead to equipment malfunctions
- ❑ Fire can ignite hydraulic lines on equipment and result in the operation shutting down
- ❑ Backup equipment should be on site or readily available
- ❑ Fire suppression devices should be on the equipment loading the burners



Scheduling Delivery of Carcasses



- Need to have good communications between depopulation and disposal crews to minimize stockpiling, and prevent decomposition of carcasses prior to burning
- Decomposed birds burn slower because released body fluids saturate the feathers.
- The released body fluids can also become a surface and groundwater contaminant.

Logistics -Wood



- ◆ 2268 tons of carcasses
- ◆ 10000 tons of wood
- ◆ 4.4 tons wood per ton of carcass

Carcass Disposal in 2006 and Beyond



Logistics -Ash

- ◆ 2268 tons of carcasses
- ◆ 5000 tons of ash
- ◆ 2.2 tons of ash per ton of carcass



Recycling Ash



◆ Power Screen

- 5 tons scrap metal
- 250 tons .75-1.5 inch material
used by landfill for temporary roads
- 250 tons of partially burned wood
given away as firewood
- 4500 tons of <.5inch material
 - used as soil amendment
 - .34 ton lime equivalent
 - 9lb.N/23lb.P/11lb.K per ton
 - \$10/ton incentive paid to farmers for transportation costs

Air Permits and Monitoring

- ◆ Va. DEQ issued an emergency air permit for up to 10,000 tons of carcasses to be burned
- ◆ Parameters monitored
 - particulate matter
 - volatile organic compounds
 - toxics
- Based on the results , this operation did not create significant health or environmental hazards



Off-Site Disposal?

- ◆ Although landfilling evolved into the preferred method of disposal in 2002, concerns about disease transmission and the potential for human health impacts make on-farm disposal methods increasingly attractive.
- ◆ Off-site incineration will be an disposal option of last resort for the next AI outbreak

Controlling Smoke and Odor

- ◆ Limiting operations during the night to limit “layered haze” (may not be practical in a large outbreak)
- ◆ Minimize the decomposition of carcasses prior to burning
- ◆ Cover carcasses and wood from precipitation
- ◆ Maintain proper loading of air curtain destructors



Neighbor Concerns

- ◆ USDA offered to pay for lodging and meals if the smoke and odor was too offensive.
- ◆ Only a few neighbors took advantage of this offer.
- ◆ As more distant neighbors complained about the smoke and odor, it became too impractical to continue this offer.

Security, Biosecurity, and Media Relations

- ❑ Security - private security firm guarded the entrance to the incineration site.
- ❑ Biosecurity – USDA kept a cleaning and disinfecting crew on site 24/7 to disinfect any vehicles exiting the site . All personnel were required to wear Tyvek suits, latex gloves, masks, disposable boots, and hairnets
- ❑ Media relations – All media inquiries were routed to the public information officer with the Task Force. There were only a few inquiries during the incineration operation.



Why did USDA discontinue this operation?

- ◆ Increasing number of complaints
- ◆ Cost per ton escalated to 2-3 times the cost of landfilling
- ◆ A contract with a large landfill was finally negotiated to accept more carcasses

Conclusions

- ◆ Landfilling was the preferred method of disposal in 2002 despite its costs.
- ◆ Incineration was the most costly method, and was the least publicly accepted method.
- ◆ Public perception can quickly influence what are acceptable disposal options.
- ◆ Contingency plans for on-farm disposal options have to be developed and maintained.

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